# (11) **EP 2 560 263 A3**

(12)

## **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3: 06.09.2017 Bulletin 2017/36

(51) Int Cl.: H02J 3/18 (2006.01)

H02J 3/16 (2006.01)

(43) Date of publication A2: 20.02.2013 Bulletin 2013/08

(21) Application number: 12176667.9

(22) Date of filing: 17.07.2012

(84) Designated Contracting States:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR Designated Extension States:

BA ME

2, ( ....

(30) Priority: **25.07.2011 US 201113189929** 

(71) Applicant: General Electric Company Schenectady, NY 12345 (US)

(72) Inventors:

 Milosevic, Borka Atlanta, GA Georgia 30339-8402 (US)  Mannar, Kamal 309494 Singapore (SG)

 Vukojevic, Aleksandar Atlanta, GA Georgia 30339-8402 (US)

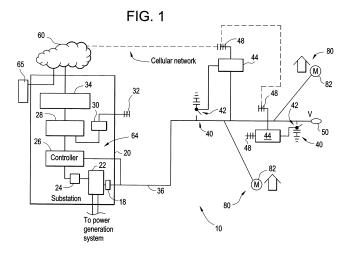
(74) Representative: Illingworth-Law, William Illingworth et al Global Patent Operations Europe GE International Inc. The Ark

The Ark
201 Talgarth Road
Hammersmith
London W6 8BJ (GB)

## (54) Power distribution system

(57) A power distribution system (10) is provided, including a controller (26), at least one capacitor bank (40) with a capacitor bank controller (44), a transformer (22), at least one voltage regulating device (14) with a voltage regulating device controller (16), and a controller (26). The capacitor bank (40) is selectively connected to the feeder (36) and a capacitor bank controller (44). The capacitor bank controller (44) controls a switch for selectively connecting the capacitor bank (40) to the feeder (36). The transformer (22) delivers power to the power

distribution system (10) through the feeder (36). The transformer (22) converts a transmission or a sub-transmission voltage into a distribution voltage. The controller (26) is in communication with the capacitor bank controller (44), the voltage regulating device (14), and the transformer (22). The controller (26) selectively switches the at least one capacitor bank (40) to adjust voltage in the feeder (36). The controller (26) selectively sends commands to the voltage regulating device (14) to change a source voltage.



EP 2 560 263 A3



Category

Χ

#### **EUROPEAN SEARCH REPORT**

"A hybrid artificial

**DOCUMENTS CONSIDERED TO BE RELEVANT** Citation of document with indication, where appropriate,

approach for feeder capacitor scheduling",

URL:http://ieeexplore.ieee.org/ielx1/59/76 54/00317624.pdf?tp=&arnumber=317624&isnumb

paragraphs [Sections1] - [0004] \*

US 2010/198422 A1 (FENG XIAOMING [US])

of relevant passages

Retrieved from the Internet:

[retrieved on 2017-07-27]

5 August 2010 (2010-08-05)

neural network-dynamic programming

IEEE Transactions on Power Systems, 1 January 1994 (1994-01-01), pages 1069-1075, XP055394198, DOI: 10.1109/59.317624

Yuan-Yih Hsu ET AL:

**Application Number** EP 12 17 6667

CLASSIFICATION OF THE APPLICATION (IPC)

INV.

H02J3/18

H02J3/16

Relevant

to claim

1-9,12,

13

1-13

5

50

The present search report has	been drawn up for all claims	
Place of search	Date of completion of the search	Examiner
Munich	1 August 2017	Grosse, Phil
CATEGORY OF CITED DOCUMENTS  X: particularly relevant if taken alone Y: particularly relevant if combined with anot document of the same category A: technological background O: non-written disclosure P: intermediate document	L : document cited for oth	nt, but published on, or application

\* paragraphs [0004] - [0052]; figure 2 \* MICHAEL J KROK ET AL: "A coordinated optimization approach to Volt/VAr control Χ 1-13 for large power distribution networks", TECHNICAL FIELDS SEARCHED (IPC) 2011 AMERICAN CONTROL CONFERENCE (ACC 2011) : SAN FRANCISCO, CALIFORNIA, USA, 29 H<sub>0</sub>2J JUNE - 1 JULY 2011, IEEE, PISCATAWAY, NJ, 29 June 2011 (2011-06-29), pages 1145-1150, XP032035326, ISBN: 978-1-4577-0080-4 \* paragraphs [SectionI] - [00IV]; figure 2 -/--2 Examiner EPO FORM 1503 03.82 (P04C01) Grosse, Philippe ring the invention out published on, or

55

page 1 of 2



## **EUROPEAN SEARCH REPORT**

Application Number EP 12 17 6667

10		
15		
20		
25		
30		

- '	DOCUMENTS CONSIDERED	O TO BE RELEVANT		
Category	Citation of document with indication of relevant passages	n, where appropriate,	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GUANGFEI GENG ET AL: "partitioning and dynamic optimization", POWER SYSTEM TECHNOLOGY INTERNATIONAL CONFERENCE PISCATAWAY, NJ, USA, 24 October 2010 (2010-10 XP031834383, DOI: 10.1109/POWERCON.20 ISBN: 978-1-4244-5938-4 * paragraphs [sectionI] 1,3 *	(POWERCON), 2010 E ON, IEEE, 0-24), pages 1-8, 010.5666514	1-13	
X	YUTIAN LIU ET AL: "Opt control in distribution INTERNATIONAL JOURNAL OU & ENERGY SYSTEMS., vol. 24, no. 4, 1 May 20 pages 271-276, XP0553947 GB ISSN: 0142-0615, DOI: 10.1016/S0142-0615(01)00* paragraphs [section1]	systems", F ELECTRICAL POWER 002 (2002-05-01), 201,	1-13	TECHNICAL FIELDS SEARCHED (IPC)
	The present search report has been dra	awn up for all claims		
	Place of search	Date of completion of the search		Examiner
	Munich	1 August 2017	Gro	sse, Philippe
X : parti Y : parti docu A : tech	ATEGORY OF CITED DOCUMENTS icularly relevant if taken alone icularly relevant if combined with another iment of the same category inological background written disclosure mediate document	T: theory or principle under the filing date D: document cited in the L: document cited in the L: document cited for one was a member of the same document	nent, but publis ne application other reasons	hed on, or

page 2 of 2

## EP 2 560 263 A3

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 12 17 6667

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-08-2017

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 2010198422	A1	05-08-2010	CN EP US WO	102308451 A 2394347 A1 2010198422 A1 2010091076 A1	04-01-2012 14-12-2011 05-08-2010 12-08-2010
951					
ORM P0459					

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82